

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Electrical Accident
March 23, 2003

No. 50 Mine
Energy Plus, Inc.
Kimball, McDowell County, West Virginia
I.D. No. 46-08776

Accident Investigators

Roger Richmond
Coal Mine Safety and Health Inspector/Accident Investigator

William L. Sperry
Coal Mine Safety and Health Inspector (Electrical)

Originating Office
Mine Safety and Health Administration
District 4
100 Bluestone Road, Mount Hope, West Virginia 25880
William A. Dupree, Acting District Manager

Release Date: September 12, 2003

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Photograph of the 480-volt receptacle located on a section power center used to detonate explosives during the accident.

OVERVIEW

On April 10, 2003, a 51-year old section foreman died from complications due to injuries received on March 23, 2003, in an electrical accident. At the time of the accident the section foreman was using 2-phases of the 480-volt, resistance grounded, 225 amp output, on the section power center to detonate explosives during construction of a boom hole. That resulted in an electrical arc that produced intense heat, resulting in serious burns to the victim's hands and face. The victim was transported to the Charleston Area Medical Center, Charleston, West Virginia and subsequently air-lifted to the Western Pennsylvania Hospital, Burn Center, Pittsburgh, Pennsylvania, where he expired due to sepsis and thermal burns.

GENERAL INFORMATION

The Energy Plus, Inc., No. 50 Mine, is located near Kimball, McDowell County, West Virginia. The operation mines the Pocahontas No. 11 coal-bed that averages 38 inches in thickness and is penetrated by five drift openings. The mine is developed using the room and pillar mining system. Coal is extracted from one development mining section using an Eimco, Model 2810-0, remote-control, continuous-mining machine. Coal is transported from the working faces by Joy 21 S.C. shuttle cars, then onto the belt conveyor system which carries the coal to the surface. The mine produces approximately 250 tons of raw coal daily. The mine employs 24 persons, working two 9-hour shifts per day, and six days per week. Coal is produced on the day and evening shifts. Maintenance is performed on the midnight shift by the evening shift crew members who stay over on the midnight shift as directed by management.

The underground crews enter the mine through drift openings and are transported to the working section via rubber-tired, battery-powered, self-propelled personnel carriers.

The immediate mine roof consists of 20 feet-to-30 feet of sandstone. The approved roof-control plan specifies installation of roof bolts at a minimum of 4 foot lengthwise and 4 foot-to-5 foot crosswise spacing. This mine liberates zero cubic feet of methane in a 24-hour period.

A Mine Safety and Health Administration (MSHA) inspection (AAA) was in progress at the time of the accident. Principal Officers of Energy Plus, Inc., at the time of the accident were Thomas W. Lusk, President; Kenneth C. Lambert, Vice President; Tommy D. Lusk, Treasurer; and Jeff Shrewsbury, Mine Foreman.

The Non-Fatal Days Lost (NFDL) incidence rate during 2002 was 7.64 for underground coal mines nationwide and 41.13 for this mine.

DESCRIPTION OF ACCIDENT

On Saturday, March 22, 2003 about 3:00 p.m., the second-shift crew, under the direct supervision of Ronald D. Williams, Section Foreman, entered the mine and traveled to the working section via rubber-tired, battery-powered, self-propelled personnel carriers. Coal production commenced at approximately 4:00 p.m. During this shift, one 480-volt ac, 3-phase, resistance grounded, 225 amp receptacle on the section power center was being alternately utilized to serve the section coal feeder and scoop battery charger. Production ceased about 11:00 p.m. Crew members, staying over on the midnight shift, then began to perform a variety of section maintenance duties including roof bolting, cleaning and rock dusting, and equipment maintenance. Preparations were being made to shoot a boom hole in the No. 6 entry sometime during the midnight shift. Explosives to shoot the boom hole had been placed underground by Jeff Shrewsbury, Mine Foreman, on Saturday, March 22, 2003, during the day shift.

Jimmie C. Dillon, Shuttle-Car Operator, transported George Lusk, Jr., Beltman, to the surface at the end of the scheduled evening shift. Dillon, while on the surface getting extra cap lights, was contacted by Williams and instructed to bring in a spool of cable. Dillon reentered the mine about 1:00 a.m., and Williams directed Dillon to help tamp the shot. While in the process of helping to load the holes, Dillon asked who was going to shoot the boom hole. According to Dillon, Williams told him that he (Williams) was going to shoot it himself. Dillon informed Williams that he did not want anything to do with setting off the shot, and returned to his cleaning and rock-dusting duties in the No. 8 entry. Also, during the boom hole preparation, Douglas Dawson, Scoop Operator, assisted in tamping seven-to-eight rows of holes in preparations of the boom hole for detonation.

Williams traveled throughout the section and informed crew members that he was ready to shoot the boom hole. Crew members stated that Williams called out the pre-shot warning, "Fire! Fire! Fire!", immediately prior to the detonation of the explosives.

Clyde Vault, Continuous-Mining-Machine Operator and Danny Austin, Electrician, stated that they were located in the No. 5 face, performing maintenance work on the continuous-mining machine when the shot was detonated. Within one or two minutes after detonation of the explosives, Vault heard Williams call for help. Vault crawled from the No. 5 face area to the outby intersection, near Survey Station No. 1585, where he found Williams. Vault observed that Williams was sitting on the mine floor, arms outstretched, with serious burns to his hands and face. Williams instructed Vault to check the power center. Vault opened the visual disconnects, crawled around the power center, and pushed the 225 amp breaker operating handle from the "up" normally closed position to the down and "reset" position. Vault then crawled from the power center to Williams' location. Vault stated that Williams informed him that, "I have really messed up." Williams then directed Vault to roll up the shooting cable and not tell anyone.

Other crew members arrived shortly, rendered first-aid, and prepared Williams for transport to the surface. Surface personnel were notified to call for an ambulance. The McDowell County

911 Service received the call at 4:48 a.m. The ambulance arrived at the mine site at 5:11 a.m. Williams was transported to the surface by Dillon, Dawson, and William T. Lusk, Roof-Bolter Operator.

Jerry Farmer, Roof-Bolter Operator/Certified Foreman, performed a pre-shift examination for the oncoming shift while Vault and Austin waited near the accident site. Vault rolled up the shooting cable as he had been asked by Williams and placed it on the rubber-tired vehicle normally utilized by Williams, beside the shooting battery. Farmer completed the pre-shift examination. Farmer, Vault, and Austin then traveled to the surface.

The ambulance departed the mine site at 5:22 a.m., with Williams aboard. After assessing Williams' injuries, ambulance personnel requested Health Net assistance. The ambulance arrived at the Mt. View High School near Welch, West Virginia, at 6:04 a.m., where Williams was transferred to a Health Net helicopter and transported to the Charleston Area Medical Center, Charleston, West Virginia. Williams was subsequently airlifted to the Western Pennsylvania Hospital Burn Center, Pittsburgh, Pennsylvania.

INVESTIGATION OF ACCIDENT

Donald W. Fink, Coal Mine Inspector in the Princeton Field Office, received a call on Monday, March 24, 2003, at 6:45 a.m., (nearly 26 hours after the accident) from Jeff Shrewsbury, Mine Foreman at the Energy Plus, Inc., No. 50 Mine. Shrewsbury reported that an electrical burn accident had occurred. Fink informed David Ratcliff, MSHA Princeton Field Office Supervisor, of the call and Ratcliff directed William L. Sperry, Coal Mine Inspector (Electrical) and Preston T. White, Mine Safety and Health Specialist (Education Field Services), to travel to the mine and investigate the cause of the accident. The investigation was conducted in conjunction with the West Virginia Office of Miners' Health, Safety and Training (WVOMHST) with assistance from the operator and their employees. Persons with knowledge of the accident and/or present during the investigation are listed in Appendix A of this report.

Representatives of MSHA, the WVOMHST, and company officials traveled to the underground accident site to conduct an investigation of existing physical conditions. Photographs, sketches, and relevant measurements were taken at the accident site.

Upon arrival at the accident site, the investigation team found that repairs had been made to the section power center. The team later determined that physical evidence relative to the events surrounding the accident had been altered or removed. Informal interviews with persons believed to have knowledge of the accident were conducted on March 24, 2003, at the mine site.

All miners and mine management personnel who were interviewed stated that they had no knowledge of the cause of the accident or Williams' work activities prior to or during the accident.

In the days following the accident, MSHA and the WVOMHST learned that the victim's condition had worsened. Failing to identify the cause of the accident through examination of physical evidence or information provided by miners and mine management, the agencies conducted additional interviews. On April 1, 2003, formal interviews were conducted with persons believed to have knowledge of the accident at the WVOMHST Field Office, Welch, West Virginia. As in the mine site interviews, miners and mine management stated that they had no knowledge of events surrounding the accident. Additional accident site investigation activities were conducted on April 2, 2003. Williams expired on April 10, 2003.

Components of the power center involved in the accident were sent to the MSHA Approval and Certification Center, Triadelphia, West Virginia, for testing. Test results showed no malfunctions that would reasonably be expected to cause the accident.

In view of these test results and many unanswered questions regarding the victim's work activities and cause of the accident, MSHA and the WVOMHST interviewed the miners and mine management a third time on May 29 and 30, 2003, at the Mine Safety and Health Administration's Pineville Field Office. During these interviews, miners told about Williams shooting the boom hole and calling for help shortly after the detonation. A combination of this information and physical evidence allowed investigators to determine the cause of the accident.

DISCUSSION

Training

A review of training records indicates that training had been conducted in accordance with the 30 CFR, Part 48.

Examinations

A review of records and observation of the physical evidence indicates that the required examinations had been conducted in accordance with the 30 CFR.

Physical Factors

1. The accident occurred in the No. 5 entry, twenty-five feet outby Survey Station No. 1585, near the section power center.
2. The section power center is supplied by a 4160 volt ac, 3-phase, resistance grounded service, originating on the surface. The output service involved in the accident was a 480-volt, ac, three-phase, resistance grounded service, being alternately utilized to serve a scoop charger and the section coal feeder.

3. The Pemco Ground Wire Monitor, Part No. 61809, Acceptance No. 092876P, used for the circuit involved in the accident, functioned when tested by the Approval and Certification Center.
4. Tom Lusk, Superintendent of Deep Mines, examined the circuit breaker on Sunday, March 23, 2003. He determined that the circuit breaker contacts were in the closed position when the operating handle was in the “reset” position.
5. A weekly electrical examination of the power center was recorded as being conducted on 3/20/03. All circuit breakers were checked for ground fault and all checked “ok” for the week ending 3/15/03.
6. At the time of the accident, the section foreman was using 2-phases of the 480-volt, resistance grounded, 225 amp output, on the section power center to shoot a boom hole.
7. The boom hole originated in the No. 6 entry, near Survey Station No. 1592 and extended toward the No. 7 entry.
8. Persons interviewed on May 29 and 30, 2003, were unable to provide accurate information as to the actual dimensions or the number of holes drilled to develop the boom hole. An inventory of explosives revealed that 100 pounds of explosives and 55 electric blasting caps were used to develop the boom hole.
9. Only one detonation was reported by persons interviewed; therefore, more than 20 shots were detonated in one round.

ROOT CAUSE ANALYSIS

A root cause analysis was performed on the accident. The following root cause was identified:

1. Causal factor: A boom hole was charged and detonated by a non-certified shot firer.

Discussion: Work requiring qualified or certified persons should be performed by such persons. The victim was not a certified shot firer.

Corrective Action: Only qualified or certified persons should conduct such work activities.

2. Causal factor: A boom hole, in excess of 20 shots, was detonated in one round to develop an underground boom hole.

Discussion: 30 CFR 1320(a) limits the maximum allowable number of shots to 20.

Persons interviewed on May 29 and 30, 2003, were unable to provide accurate information as to the actual dimensions or the number of holes drilled to develop the boom hole. Retreat mining had since commenced in the boom hole area; therefore, a physical inspection of the boom hole

could not be conducted. Inventory of explosives revealed that 100 pounds of explosives and 55 electric blasting caps were utilized by the shot firer to develop the boom hole. Only one detonation was reported by persons interviewed.

Corrective Action: Comply with all blasting regulations. If needed, special blasting permits should be obtained for site specific requirements that fall outside the blasting regulations.

3. Causal factor: The Model VME 450 Blasting Machine, Serial Number 4774, obtained from the mine, is not on the approved list of permissible blasting machines. The 480-volt ac, 3-phase, resistance grounded, 225 amp receptacle on the section power center, utilized to detonate explosives, is not a permissible blasting machine.

Discussion: Only approved and properly maintained blasting equipment shall be utilized when blasting in underground coal mines.

Corrective Action: Only approved blasting machines of adequate size for the number of shots shall be utilized in underground coal mines for blasting.

CONCLUSION

It is the consensus of the investigation team that the direct cause of the fatal accident was the victim's use of 2-phases of an energized 480-volt, resistance-grounded, 225 amp circuit on the section power center to detonate explosives. This resulted in an electrical arc that produced intense heat. Williams, being in the immediate area of the arcing fault, received burns that resulted in his death on April, 10, 2003.

ENFORCEMENT ACTIONS

Contributing Violations

1. A 104 (d) (1) citation, No. 7198188 was issued to Energy Plus Inc. for a violation of 75.1310(c) stating in part that a permissible blasting unit was not used to fire explosives.
2. A 104 (d) (1) order, No. 7198189 was issued to Energy Plus Inc. for a violation of 75.1325(a) stating in part that a person qualified to fire explosives was not present when a shot was detonated on March 23, 2003.
3. A 104 (d) (1) order, No. 7198190 was issued to Energy Plus Inc. for a violation of 75.511 stating in part that an agent of the operator, not qualified to perform electrical work, performed such work on March 23, 2003.

Non Contributing Violations

1. A 104 (d) (1) order, No. 7198191 was issued to Energy Plus Inc. for a violation of 75.1317(a) stating in part that an agent of the operator, not qualified as defined in 75.1301, actively engaged in priming charges in preparation for detonation of explosives.
2. A 104 (d) (1) order, No. 7198192 was issued to Energy Plus Inc. for a violation of 75.1318(a) stating in part that a section foreman who was not qualified to use explosives, loaded explosive cartridges into holes drilled to establish a boom hole. He also allowed two other miners to participate in the loading process.
3. A 104 (d) (1) order, No. 7198193 was issued to Energy Plus Inc. for a violation of 75.1320(a) stating in part that more than 20 boreholes were fired in one round to develop a boom hole on the working section.
4. A 104 (d) (1) order, No. 7198194 was issued to Energy Plus Inc. for a violation of 75.1323(j) stating in part that blasting circuits were not tested for continuity and resistance prior to firing, with a galvanometer or other instrument specifically designed for testing blasting circuits.
5. A 104 (a) citation, No. 7217248 was issued to Energy Plus Inc. for a violation of 50.10 stating in part that the operator failed to immediately notify MSHA that a reportable accident had occurred.
6. A 104 (a) citation, No. 7217249 was issued to Energy Plus Inc. for a violation of 50.12 stating in part that the operator altered the site where the victim was seriously injured.

Approved by:

**William A. Dupree, Jr.
Acting District Manager**

APPENDIX - A

Listed below are the persons furnishing information and/or present during the investigation (* indicates persons interviewed).

Energy Plus, Inc.

| | |
|------------------------|----------------------------------|
| Jeff Shrewsbury * | Mine Foreman |
| Clyde E. Vault* | Continuous Miner Operator |
| Jerry Farmer * | Roof Bolter Operator |
| William T. Lusk * | Roof Bolter Operator/Electrician |
| Jimmy C. Dillon, Jr. * | Shuttle Car Operator |
| Jackie D. Harmon * | Electrician |
| Danny Austin * | Electrician |
| Douglas Dawson * | Scoop Operator |
| Delmus Vault * | Surface Man |

United Mine Workers of America

| | |
|-------------|-------------------------|
| Roger Yates | District Representative |
| Gary Trout | District Representative |

Bluestone Coal Corporation

| | |
|----------------------|---------------------------|
| Thomas W. Lusk* | Superintendent Deep Mines |
| Donna Kelly | Attorney |
| Christopher B. Power | Attorney |

West Virginia Office of Miners' Health, Safety and Training

| | |
|---------------------|---------------------------------|
| Fred B. Stinson | Inspector-at-Large |
| Terry L. Farley | Health and Safety Administrator |
| Donald L. Dickerson | Assistant Inspector-at-Large |
| Gary C. Barton | Electrical Inspector |
| John Scott | Electrical Inspector |

Mine Safety and Health Administration

| | |
|-------------------|---|
| Roger Richmond | Accident Investigator |
| William L. Sperry | Coal Mine Safety and Health Inspector (Electrical) |
| Preston T. White | Education Field Services |
| Jim Beha | Accident Investigation Coordinator |
| Larry Cook | Supervisory Electrical Engineer |